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$-\frac{3}{2}\beta^2$ ; and that  $y_2, y_2, y_3$  are the roots of another in which the coefficient of  $y^2$  is zero and that of  $y$  is  $-\frac{3}{2}a^2$ . Hence if

$$\begin{aligned}x_1 &= \sqrt{2}\beta \cos \varphi, \\x_2 &= \sqrt{2}\beta \cos (\varphi + \frac{2}{3}\pi), \\x_3 &= \sqrt{2}\beta \cos (\varphi + \frac{4}{3}\pi); \\y_1 &= \sqrt{2}a \cos \theta, \\y_2 &= \sqrt{2}a \cos (\theta + \frac{2}{3}\pi), \\y_3 &= \sqrt{2}a \cos (\theta + \frac{4}{3}\pi).\end{aligned}$$

Equation (3) of the problem then becomes

$$2a\beta[\cos \theta \cos \varphi + \cos(\theta + \frac{2}{3}\pi) \cos(\varphi + \frac{2}{3}\pi) + \cos(\theta + \frac{4}{3}\pi) \cos(\varphi + \frac{4}{3}\pi)] = 0.$$

But twice the product of the cosines of two arcs is equal to the cosine of the sum of the two arcs plus the cosine of their difference. Hence

$$3\cos(\theta - \varphi) + \cos(\theta + \varphi) + \cos(\theta + \varphi + \frac{4}{3}\pi) + \cos(\theta + \varphi + \frac{2}{3}\pi) = 0.$$

But  $\cos(\theta + \varphi) + \cos(\theta + \varphi + \frac{2}{3}\pi) + \cos(\theta + \varphi + \frac{4}{3}\pi) = 0$  whatever the values of  $\theta$  and  $\varphi$ ;  $\therefore \cos(\theta - \varphi) = 0$ , and  $\theta - \varphi = \frac{1}{2}\pi$ . Hence

$$\cos^2 \theta + \cos^2 \varphi = 1.$$

But  $\cos \theta = \frac{y_1}{\sqrt{2}a}$  and  $\cos \varphi = \frac{x_1}{\sqrt{2}\beta}$ . Therefore

$$\frac{y_1^2}{2a^2} + \frac{x_1^2}{2\beta^2} = 1;$$

$$\therefore a^2 x_1^2 + \beta^2 y_1^2 = 2a^2 \beta^2.$$

Since  $\theta - \varphi = \frac{1}{2}\pi$ ,  $\cos^2(\theta + \frac{2}{3}\pi) + \cos^2(\varphi + \frac{2}{3}\pi) = 1$ . Hence

$$a^2 x_2^2 + \beta^2 y_2^2 = 2a^2 \beta^2,$$

and in a similar manner it may be shown that

$$a^2 x_3^2 + \beta^2 y_3^2 = 2a^2 \beta^2.$$

## CORRESPONDENCE.

*Editor Analyst:*

I was somewhat surprised that you should think that your readers would not take much interest in what I regard the most curious mathematical discoveries ever made, and which have enabled me to calculate the logarithms of all the prime numbers under 100 000 true to 40 decimal places, and all under 3000 true to 64 places; and all the Napierian logarithms under 1300 true to 76 places. Also to make four sets of tables by either of which I can find the logarithm of any number whatever, true to 65 decimal places and

the Napierian logarithms true to 76 places. And I have determined the modulus of the Napierian, and also of Briggs' system of logarithms true to more than 100 places.

I wish to call your attention to the logarithms on one of the sheets which I send enclosed, in which you will see that the several numbers and their corresponding logarithms are composed of the same figures, the index of the log. representing the first figure of the number and the following figures in each exactly corresponding.

If you choose to publish these numbers with the offer of \$10 to any one who will add 10 more figures to either of them that will correspond to the logarithm of the same, I will be pleased to have you do so; and as soon as I have tested the truth of the additions I will forward the money. I inclose two or three papers that give some slight clue to my method of finding logarithms, and close by sending you the logarithms of 2 and 3 to 91 places each.

Log. 2 = .30102999566398119521373889472449302676818988146210  
85413104274611271081892744245094869272519.

Log. 3 = .47712125471966243729502790325511530920012886419069  
58648298656403052291527836611230429683556.

D. M. KNAPEN.

Castleton, Vermont.

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ANNOUNCEMENT.—WE regret to have to inform our readers that we have concluded to discontinue the publication of the ANALYST on the completion of Vol. X. This determination has not been induced by any lack of interest in the publication manifested by our subscribers and contributors, most of whom have generously stood by us and assisted us during the whole of the ten years life of our publication, but wholly on account of our declining health. In taking leave of our contributors and subscribers, we do not propose to waste words in any attempt to apologize for the many defects in our production, but will only say that we are fully sensible of, and regret, their existence, but did the best we could, under the circumstances, to avoid them.

We trust that, notwithstanding its defects, the ANALYST will be found to contain many papers of much interest and permanent value, which have been contributed by some of America's ablest mathematicians and astronomers.